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Incentive and incarceration effects in a general equilibrium model of crime

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Abstract

An intertemporal general equilibrium model of criminal behavior is used to analyze the effect on crime of changing policy parameters, specifically the length of the prison term, the severity of punishment, and the amount of police resources. The number of crimes in society can be decomposed into an incentive part, an incarceration part, and a crime competition part.

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1. Introduction

In the literature on crime and punishment, it is common to distinguish between the incentive and the incarceration effect of prison sentence.[1] This is intuitively natural; a longer prison term is likely both to discourage (the incentive effect) and to disable (the incarceration effect) people from engaging in criminal activities. One reason why these two

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[1] See, for example, Ehrlich (1981), Shavell (1987) and Polinsky and Shavell (2000). For empirical studies of the two effects, see Levitt (1998) and Kessler and Levitt (1999).

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components of crime are so often discussed is probably that knowledge of their respective magnitudes is important for the evaluation of crime policy.

An emerging standard in the literature is to discuss crime and punishment in a general equilibrium framework; this will be done in the present paper, too. Also, a meaningful treatment of prison sentences requires an intertemporal model.[2] In the present paper, we will provide an analysis of incentive and incarceration effects within the framework of an intertemporal general equilibrium model based on individual preferences.

In virtually all papers on the economics of crime following Becker (1968), people are assumed to differ with respect to their productivity in honest work. Low-productivity individuals will thus choose to become criminals. An interesting feature of the intertemporal approach is that it allows for other assumptions as to what determines people's choice of whether to engage in criminal activities. We have thus assumed that everybody has the same productivity in honest work, but that people differ in terms of time preference. This is technically a minor issue; the model could be solved using the standard assumption (i.e., different productivity and identical rates of time preference) as well, but since the assumption of different time preferences has not been made before, we choose it for the sake of novelty.

Some writers have observed that in reality, criminals seem to have a very strong preference for immediate gains as compared to future costs (see, for instance, DiIulio, 1996). This has sometimes been interpreted as a contradiction to Becker's approach to crime, indicating that criminals are simply irrational. However, a high propensity to commit crimes can equally well be interpreted as a high rate of time preference that is perfectly compatible with rational behavior.

In our model, we abstract from human capital accumulation. In a more complicated model, where such accumulation is taken into account, one might obtain an interesting correspondence between differences in wages and differences in time preference. One would expect that a consequence of being patient is the acquisition of more human capital, resulting in differences in wages across individuals even if all individuals have the same intrinsic productivity. It would then be difficult to tell empirically whether a high propensity to commit crimes is the result of a low wage or of a high rate of time preference.

To evaluate social policy, empirical knowledge is needed with respect to the relative impact of the severity of punishment and the length of the prison term. These relative impacts could differ depending on the set-up of the underlying theoretical model. It is therefore important to work out different model formulations. For instance, if people differ with respect to time preference instead of wages, a longer prison term will have smaller and smaller effects on incentives, and in the limit only the incarceration effect remains.[3] It

[2] For general equilibrium (although not explicitly intertemporal) analyses of crime, see Fender (1999), Murphy et al. (1993) and Furlong (1987). For intertemporal (although not general equilibrium) analyses, see Davis (1988) and Leung (1994, 1995). In addition, Ehrlich (1973), Carr-Hill and Stern (1973) and Phillips and Votey (1975) use econometric models implying a general equilibrium approach.

[3] Advocating longer prison terms must therefore be based on the presumption that the incarceration effect is sizeable. This in turn is contradicted by the fact that as most criminals reach middle age, their propensity to continue with criminal activity drops (thus, prison terms so long that octogenarians are locked up would not affect crime very much). All this illustrates the importance of trying to evaluate the magnitudes of the incentive and incarceration effects, preferably in a general equilibrium framework.